Med Clean Propre Limpio Terraneum

UNEP

Regional Activity Centre for Cleaner Production

MINISTERIO DE MEDIO AMBIENTE

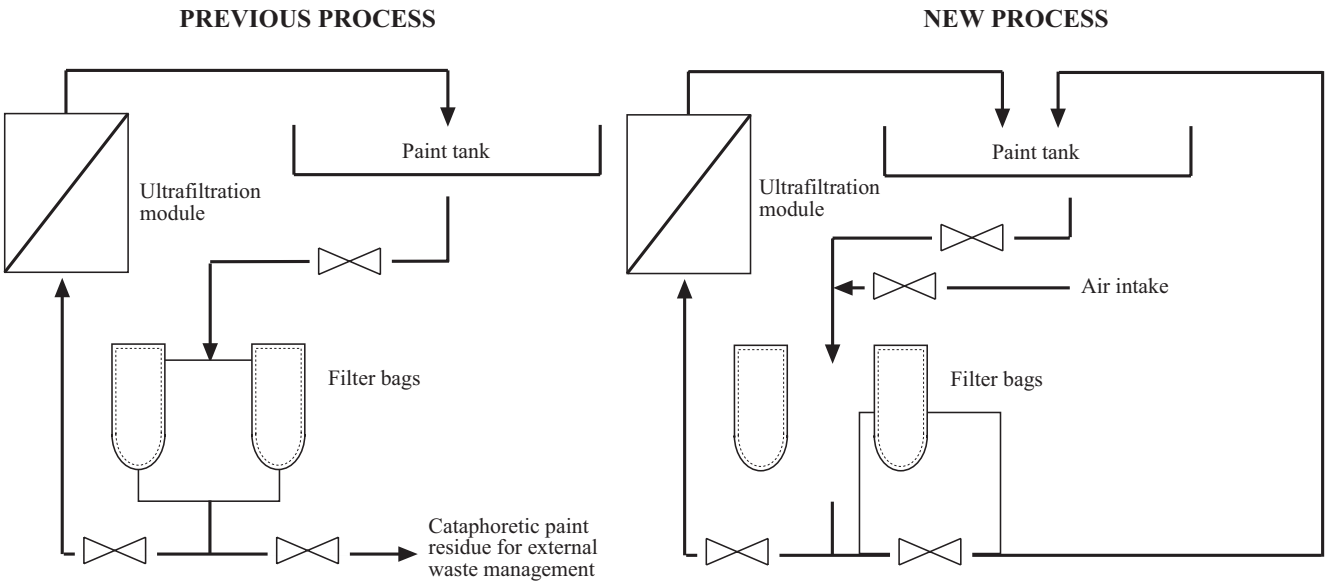
Generalitat de Catalunya
Government of Catalonia
Department of the Environment and Housing

No. 7 Examples of waste and emission minimisation initiatives

Exploitation of raw materials in maintenance operations

Company	Recubrimientos Industriales J. Miralles, SA (Sant Boi de Llobregat - Spain)
Industrial sector	Treatment and industrial painting of parts
Environmental considerations	The company has an installation for the preparation and painting of parts by cationic electrolytic coating (cataphoresis). The paint used in the cataphoresis bath is soluble with a solid content of approximately 20 to 22%, 1.5% of which contains lead silicate, a toxic water-soluble chemical compound. The paint is gradually contaminated with solid particles and oil residue from parts, from the water originating from the material dragged from the treatment and from the rinsing baths prior to the painting process. In order to maintain the physicochemical characteristics of the paint, it is continuously filtered with an ultrafiltration unit, which makes it possible to recover, on the one hand, the cataphoretic paint that is returned to the paint bath, and on the other, the water used in the rinsing subsequent to the painting process.
Background	In order to protect the ultrafiltration unit, the paint has to be filtered to eliminate any solid particles and oil residue left by the parts themselves that are being painted. This prior filtration is carried out using filter bags, which are made of a material that absorbs the oil contained in the paint. These filter bags must be changed frequently in order to maintain the properties of the paint being fed into the ultrafiltration module, and the body of the filters should preferably be free of paint at the time of replacement. For reasons of space, due to the fact that the filters were located at a lower level than the paint tank, the pipes had to be totally emptied in order to proceed with the replacement; this resulted in the loss of significant quantities of paint, which had to be managed externally as waste.
Summary of actions	The improvements that have been carried out include the adaptation of the cleaning circuit by rerouting the output from emptying the filters directly to the paint tank and adapting the air valve, already installed in the filters, so that it permits the controlled entry of compressed air from the plant's main line, without producing foam. These improvements have made it possible to modify the filter replacement operations. Now, the compressed air is used to propel the paint contained in the filters and pipes to the paint tank, overcoming the difference in level between the filters and the tank, thus allowing the cataphoretic paint to be recovered.

Diagrams



Balances

	Cost	Savings
Material balance		
The volume of paint recovered during each filter replacement operation		**98.4 l**
Number of replacements/year		**33**
Total volume of paint recovered		**3,247.2 l/year**
Economic balance		
Cost of cataphoretic paint (20-22% solid content)	**1.25 USD/l**	
Cost of treatment and external management	**0.16 USD/l**	
Total saving		**4,546.1 USD/year**
Investment	**USD235**	
Payback period		**19 days**

Conclusions

With the implementation of certain low-cost improvements, the company has, on the one hand, obtained significant savings in the raw materials, and on the other, an additional saving in environmental management costs.

The investment made was recouped in an exceptionally short period of time.

NOTE: This case study seeks only to illustrate a pollution prevention example and should not be taken as a general recommendation.

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